KOLOSHNIKOV, V.G.; MAZING, M.A.; MANDEL'SHTAM, S.L.; MARASANOV, Yu.P.

Using a Fabry and Perot etalon for the study of line widths in pulse discharge spectra. Opt.i spektr. 11 no.4:556-558 O '61. (MIRA 14:10)
(Electric discharges) (Scintillation spectrometry)

S/504/61/015/000/001/002
B102/B104

24.2120
9,3150 (1502,1538)

AUTHOR: Mazing, M. A.

TITLE: Broadening and shift of spectral lines in a gas-discharge plasma

PERIODICAL: Akademiya nauk SSSR. Fizicheskiy institut. Trudy, v. 15, 1961, 55 - 121

TEXT: This dissertation for the degree of Candidate of Physical and Mathematical Sciences, written under the supervision of Professor S. L. Mandel'shtam, Doctor of Physical and Mathematical Sciences, was defended at the Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute imeni P. N. Lebedev, AS USSR) on June 22, 1959. The purpose of the experimental and theoretical studies was to obtain data on the interactions of the emitting ion with other surrounding particles from the broadening and shift of the spectral lines emitted from ionized gases during the discharge. The dissertation is divided into four sections: 1) theory of line deformation; 2) experimental studies on spark discharges; 3) experimental studies on arc discharges; 4) discussion of results, and comparison

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between experiment and theory. Studies performed on helium and argon discharges showed at first that the lines can be divided into three groups: a) large shift, large broadening; b) large broadening, slight shift; c) slight shift, slight broadening. Accordingly, there is no simple relation between broadening and shift. The experimental studies, which have been performed very thoroughly, showed no agreement with the following conclusions drawn from the steady collision theory: 1) The line width γ and the shift Δ are proportional to $C_4^{2/3}$, C_4 being Stark's constant; 2) $\gamma/\Delta = 1.16$. The experimental values of C_4 obtained, e.g., for the Ar II line differ from the theoretical ones by two orders of magnitude. Agreement is much better with the non-steady theory of Stark broadening in gas-discharge plasmas, developed by L. A. Vaynshteyn and I. I. Sobel'man (Optika i spektroskopiya 6, 440 (1959)), which indicates that this theory should be further developed. It must consider both the quantity C_4, which is easily measurable by experiment, and the inelastic collision cross section, which is very difficult to measure, are required to enter into this theory. Conclusion of the author's results which make no claim to finality:

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1) Width and broadening of more than 50 spectral lines were experimentally studied on spark discharges, in which the broadening is entirely due to the interaction of the radiating atoms with the surrounding ions and electrons. 2) Between the Weisskopf-Lindholm theory and experiment there is a great qualitative divergence: Line width and shift depend much less on C_4 than would follow from this theory; $\gamma/\Delta \neq 1.16$, and is in no way constant for all lines. 3) The generalized non-steady theory of line broadening and experiment are in qualitative consistency. The theoretically required dependence of width and shift on the parameter

$$\beta = \frac{(2\pi c)^{3/2}\,(q\ \mathrm{cm}^{-1})^{3/2}\,C_4^{1/2}}{v^2}$$

could be verified experimentally:

$$\gamma = 11{,}4C_4^{2/5}v_{0n}^{1/5}N_{0n}\left[I'(\beta) + \left(\frac{2mZ^2}{M}\right)^{1/6}\right];$$

$$\Delta = 9{,}8C_4^{2/5}v_{0n}^{1/5}N_{0n}\left[I''(\beta) + \left(\frac{2mZ^2}{M}\right)^{1/6}\right].$$

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The divergence from the steady theory begins with $\beta < 1$. It becomes the greater, the smaller β. 4) Nevertheless, certain lines show a considerable difference between the theoretical and the experimental value of γ/Δ. This is ascribed to the existence of some perturbed levels near the level considered. 5) Using the theoretical relations between γ, Δ, and the electron concentration N, and substituting the measured values of γ and Δ, one obtains $N \sim 1.5 \cdot 10^{17}$ cm^{-3} for argon, and $N \sim 7 \cdot 10^{16}$ cm^{-3} for helium. 6) The interpretation of the asymmetry of line broadening is discussed in a special section. The first moment of the intensity distribution, i. e., the shift $\bar{\omega}$ of the center of gravity of the line is proposed as a quantitative characteristic of line broadening: $\bar{\omega}_{ion} = 9.8\, C_4^{2/3} v_{ion}^{1/3} N \cdot a^{1/4}$;

$\bar{\omega}_{el} = 9.8\, C_4^{2/3} v_{el}^{1/3} N''(\beta)$; $\bar{\omega} = \bar{\omega}_{el} + \bar{\omega}_{ion} = 9.8\, C_4^{2/3} v_{el}^{1/3} N_{el}$

$\left[I''(\beta) + \left(\frac{2m}{M} Z^2 \right)^{1/6} \cdot a^{1/4} \right]$. 7) In the plasma of an arc discharge in air, in which

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the line broadening is brought about by the joint action of neutral and charged particles, the author studied the broadening and shift of five Ca I lines. 8) Simultaneous measurement of broadening and shift made it possible to distinguish between the role of Stark interaction and that of van der Waals interaction. Neutral particles were found to be the most important factor in the broadening of the lines considered. Only one-fifth of the broadening is attributed to the action of ions and electrons. 9) The constant C_6 for the excited levels of Ca I was determined from the contribution made by van der Waals interaction. Professor S. L. Mandel'shtam is thanked for guidance, L. A. Vaynshteyn and I. I. Sobel'man for discussions, and N. A. Brublevskaya. Control measurements were made by V. G. Koloshinkov. L. Ya. Khlebnikova, V. I. Danilova, and V. F. Kitayeva are mentioned. There are 21 figures, 37 tables, and 49 references: 19 Soviet and 20 non-Soviet. The four most recent references to English-language publications read as follows: B. Kivel. Phys. Rev. 98, 1055 (1955); H. E. Petschek. Journ. Apll. Phys. 28, 83 (1955); L. Blitzer. JOSA, 45, 564 (1955). S. Ch'en, M. Takeo. Rev. Mod. Phys. 29, 20 (1957).

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26409
S/056/61/041/001/004/021
B102/B212

26.2314

AUTHORS: Averin, V. G., Mazing, M. A., Pisanko, A. I.

TITLE: Spectroscopic investigation of a toroidal discharge

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no.1(7), 1961, 42 - 48

TEXT: The authors report on spectroscopic investigations of light emitted from plasma in a "Beta" toroidal chamber under various test conditions. Contrary to the "Alpha" and "Zeta" chambers, this chamber has a considerably higher current density. Here are some parameters of the "Beta" chamber: Main torus diameter: 750 mm; diameter of the discharge chamber: 210 mm; duration of discharge: 670 μsec; field: 200 - 1100 oe; maximum discharge current: 120 ka (at 1.5 kv); maximum current density: 400 a/cm^2. The light emitted by the plasma was observed through a quartz window. Two mirrors were used to reflect it to two monochromators of type ЗМР-2(ZMR-2). At the outputs of these monochromators there were photomultipliers of type ФЭУ-18(FEU-18). The pulses from the multipliers were fed to the oscilloscope ОК-24МКБ(OK-24MKB) via two amplifiers. The discharge current was

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measured with the help of a "Rogovskiybelt" probe. After integration its signals were fed to an DK-17M(OK-17M) oscilloscope. The voltage pulses were fed to the second input of this oscilloscope. The intensity of the spectral lines has been studied as a function of time for oxygen, fluorine, nitrogen, carbon, and helium and also the influence of initial conditions on the discharge and the influence of impurities. The following has been found: Ions with various charges start to emit light at various instants after the discharge has started. Ions with higher charges (OV, FV) will start later to emit light than ions with lower charges (OIII, FIII). All lines show an intensity minimum where the discharge current has its maximum. On both sides of this minimum OIII and OIV have distinct maxima; OV, however, has only a weak one at the end of discharge. The intensity characteristics with respect to time of NV, NIV, and CIII are similar to those of OII, OIV, FIII and FIV. It has been found that the occurrence of an intensity dip of the lines was very sensitive with respect to changes in pressure, discharge current and magnetic field. The plasma resistance is also a function of these parameters. If the field deviates from its optimum value (150 - 200 oe) on either side the dip will disappear and strong intensity fluctuations will show up. Analogous conditions are found if the optimum pressure is not kept

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($3.5 - 4.5 \cdot 10^{-3}$ mm Hg). A decrease of the discharge current will also bring about a flattening and, finally, a disappearing of the minimum. When 50 % He was added to H, no changes occured, just as in a discharge in pure He. Addition of argon, however, had a significant influence. The occurrence of a minimum may be explained by at least two hypotheses. The degree of ionization (OII→OIV→OV→OVI) which increases with the electron temperature, can be considered as the cause, or due to instabilities during discharge the plasma may touch the wall. The electron temperature will drop, and an intensity dip will occur. The first assumption seems more probable. An analogous dip was also found in the chamber "Scilla" (Phys. Rev. 119, 843), and is attributed to the transition $O^{5+} \rightarrow O^{6+}$ due to an increase of the electron temperature. At a discharge current of 120 ka, the electron temperature will reach about 30 ev and keep this value for about 100 µsec. The rate of temperature increase and the maximum temperature depend on the discharge current. At 50 ka the electron temperature is not higher than 14 ev at the moment of maximum current. In order to determine the maximum electron temperature exactly, it would be necessary to investigate the intensities of the lines OVI, FVI and, if possible, OVII as a function of time. The authors thank Academician I. K. Kikoin and Professor S. L.

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Spectroscopic investigation of...

Mandel'shtam for advice and interest, and V. V. Sokol'skiy for help and discussion. There are 5 figures, 1 table, and 6 references: 2 Soviet-bloc and 4 non-Soviet-bloc. The two most important references to English-language publications read as follows: F. C. Jahoda et al. Phys. Rev. 119, 843, 1960; C. Brenton, L. Herman. IV. Internat. Conf. on Ionization Phenom. in Gases, Uppsala, 1959, p. 17.

SUBMITTED: January 21, 1961

Legend to the Table: (1) Line; (2) transition; (3) energy of the upper level, ev.

Линия (1)	λ, Å	Переход (2)	Энергия верхнего ур(3)ня, eV
OV	2781	$3s^2S_1—3p^3P_2$	81.
OIV	3063	$3^3S_{1/2}—3^3P^0_{3/2}$	48
OIII	3047	$3s^3P^0_2—3p^3P_2$	37
FV	2707	$3s^4P^0_{7/2}—3p^4D_{9/2}$	81
FIV	2826	$3s^3P^0_2—3p^3D_3$	56
FIII	2994	$3s'^4S^0_{5/2}—3p'^4P_{1/2}$	53
NV	4945	$6^2G—7^2H^0$	91
NIV	3485	$3^3S_1—3^3P^0_1$	50
CIII	4650	$3^3S_1—3^3P^0_1$	32
He II	4685.	$3^3D—4^3F$	51

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S/051/62/013/003/002/012
E202/E435

AUTHORS: Mazing, M.A., Vrublevskaya, N.A.

TITLE: Broadening of spectral lines in a strongly ionized plasma. II. Broadening of the inert gases ions lines

PERIODICAL: Optika i spektroskopiya, v.13, no.3, 1962, 308-312

TEXT: Using spark discharge energized by an ИГ-2 (IG-2) generator (14 kV, 0.02 μF, approx. 10 μH), operating at atmospheric pressures, the broadening and the shift of 12 lines of Ne II and 22 lines of Kr II were measured. The results were very similar to those found during the earlier measurements of the Ar II and He I lines by the present authors (ZhETF, 36, 1959, 1329; Izv. AN SSSR, ser. fiz., 23, 1959, 1017; Tr. FIAN, 15, 1961, 55). The lines were divided into three groups. The first in which the shift did not exceed 0.5 cm^{-1}, which were of 2 to 3 cm^{-1} width having a width to shift ratio R = 5 to 10. The second group comprised lines with 1 to 3 cm^{-1} shift and with 4 to 6 cm^{-1} broadening where R = 2 to 4. The third group included lines with a shift of 4 to 5 cm^{-1} and broadening of 8 to 10 cm^{-1}, giving the lowest R = 2 to 2.5. The tables which include the calculated and observed R values contain also the

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earlier data on Ar II and He I. Detailed experimental data were given by M.A.Mazing (Tr. FIAN, 15, 1961, 55). There are 1 figure and 2 tables.

SUBMITTED: June 21, 1961

VRUBLEVSKAYA, N. A.; MAZING, M. A.; MARINKOVIC, M.

"Spectral Al III Line Broadening and Shift in Strongly Ionized Plasma."

report submitted to 11th Intl Spectroscopy Colloq, Belgrade, 30 Sep-4 Oct 63.

Physics Inst im P.N. Lebedev, AS USSR, Moscow.

S/0051/64/016/001/0011/0016

ACCESSION NR: AP4011480

AUTHOR: Mazing, M.A.; Vrublevskaya, N.A.

TITLE: Concerning broadening of spectrum lines in strongly ionized plasma. 3. Wavelength of the lines of multiple charged ions

SOURCE: Optika i spektroskopiya, v.16, no.1, 1964, 11-16

TOPIC TAGS: spectrum line, spectrum line shift, spectrum line broadening, ion spectrum line, aluminum(III), tin(IV), silicon(III), multicharged ion, electron density, hot plasma

ABSTRACT: The purpose of the present work was to determine to what extent the wavelength of the lines of highly ionized atoms are sensitive to the electron concentration in plasma. Accordingly, there were carried out measurements of the broadening and wavelength of the lines of a number of ions in spark sources (the only type yielding a sufficiently hot plasma) with greatly different electron densities. Specifically, there were measured the widths and frequencies of the spectrum lines of Al III, Si III, Si IV and Sn IV in spark discharges in air. The electron doncentration was varied by varying the parameters of the spark generator. One spark unit

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(IG-2 spark unit) yielded an oscillatory discharge, while the other yielded a powerful aperiodic discharge. The discharge voltage in both cases was 14 kV; the electron densities per cm^3 were estimated as 1.5×10^{17} and 6×10^{17}. The spectra were recorded by means of a DFS-3 diffraction grating spectrograph with a dispersion of 2 Å/mm. The wavelength of the lines corresponding to several transitions in the emerated ions are tabulated. Comparison shows that the lines shift by as much as 1 Å in going from one discharge condition to the other; also the recorded wavelengths differ from the tabulated values, but there is no consistent regularity in the variation. In addition to change in the wavelength of the lines, significant changes in the line width were observed in going from one discharge condition to the other. The line broadening was attributed mainly to the quadratic Stark effect on the basis of theoretical evaluations. There is linear correlation between the line width and shift. It is concluded that for constructing level diagrams for highly ionized atoms one should not use direct experimental results but the results of series of measurements with extrapolation to "zero" electron density. Unperturbed lines can be observed in modern "hot plasma" installations with an electron density of 10^{13}–10^{14} cm^{-3}, but in such installations the lines may be shifted to some extent due to directed ion motion. "In conclusion, the authors express their deep gratitude to S.L.Mandel'shtam for suggesting the problem and for constant interest in the work."
Orig.art.has: 5 formulas, 2 figures and 2 tables.

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MAZING, M.A.; VRUBLEVSKAYA, N.A.

Broadening of spectral lines in a strongly ionized plasma. Opt. i spektr. 16 no.1:11-16 Ja '64. (MIRA 17:3)

ACCESSION NR: AP4013413 S/0057/64/034/002/0269/0271

AUTHOR: Averin, V.G.; Mazing, M.A.; Pisanko, A.I.

TITLE: Investigation of fluctuations in intensity of spectrum lines in a toroidal discharge in a weak magnetic field

SOURCE: Zhurnal tekhn.fiz.,v.34, no.2, 1964, 269-271

TOPIC TAGS: discharge, toroidal discharge, turbulent discharge, line intensity fluctuations, electron density fluctuations, aluminum(III), fluorine(III), fluorine(V), oxygen(IV), oxygen(V), Beta installation

ABSTRACT: The intensity fluctuations of spectrum lines in the weak magnetic field toroidal discharge of the "Beta" installation were observed over the frequency range from 10 to 100 kilocycles by an experimental technique described earlier (V. G.Averin,M.A.Mazing,A.I.Pisanko,ZhETF,41-42,1961). The following lines were observed: Al III 3621Å; F III 2994Å; F V 2707Å; O IV 3063Å; O V 2781Å. Strong fluctuations occurred, but only after thorough cleaning of the discharge chamber over a period of days. The gas pressure could be varied from 0.001 to 0.01 mm Hg. The intensity fluctuations were strongest (up to 50% of the mean) between 0.001 and 0.003

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ACCESSION NR: AP4013413

mm Hg. Above 0.005 mm Hg the fluctuations sharply decreased, and between 0.003 and 0.005 mm Hg they gave way to the characteristic "collapse" in the temporal course of the light intensity described in the reference cited above. The experimental technique was such that two spectrum lines originating in the same portion of the discharge could be observed simultaneously. Correlations were sought between the intensity fluctuations of different lines. Between the fluctuations of lines of widely different excitation energies (in particular, F V and F III, and O V and O IV) only low frequency (<20 kilocycle) correlations were present. The intensity fluctuations of lines with similar excitation energies (in particular, O V and F V) were correlated at all frequencies observed, up to 100 Kc. (Higher frequency fluctuations could not be followed because of noise in the recording equipment.) Correlations were also sought between spectrum line intensity fluctuations and the signal received by a 0.5 m antenna located near the discharge chamber. Low frequency correlations were observed, but high frequency correlations were not. It is assumed that the intensity fluctuations are due to electron density fluctuations and that spectral lines with nearly the same excitation energies originate in the same region of the discharge. It is concluded from the observed correlations, therefore, that the high frequency electron density fluctuations are of

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ACCESSION NR: AP4013413

limited spatial extent, whereas the lower frequency fluctuations extend throughout a larger region of space. "The authors express their deep gratitude to academician I.K.Kikoin and professor S.L.Mandel'shtam for discussing the results and for their constant interest in the work." Orig.art.has: 2 figures.

ASSOCIATION: none

SUBMITTED: 30Jan63 DATE ACQ: 26Feb64 ENCL: 00

SUB CODE: PH NR REF SOV: 002 OTHER: 006

Card 3/3

S/0057/64/034/004/0767/0768

ACCESSION NR: AP4028970

AUTHOR: Averin, V.G.; Mazing, M.A.; Pisanko, A.I.

TITLE: Spectroscopic investigation of a toroidal discharge

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.4, 1964,767-768

TOPIC TAGS: plasma, Beta plasma machine, electron temperature, plasma electron temperature, plasma spectrum, oxygen ion, fluorine ion

ABSTRACT: The time variation of the intensity of the O V 2781 Å and O VI 1032 Å lines in the spectrum of the "Beta" installation discharge was measured. This work was a continuation of earlier work of the same type (V.G.Averin, M.A.Mazing and A. I.Pisanko,ShETF 41,42,1961). The discharge time of the "Beta" machine was 1100 microsec and the maximum current was 120 ka. The lines were isolated with a 70° constant deflection diffraction grating monochromator (dispersion 16 Å/mm) and were recorded by means of a sodium salicylate screen, a photomultiplier, and an oscilloscope. As was previously observed (loc.cit.supra), the O III, O IV, O V, F III, V IV, and F V lines decreased in intensity during the portion of the discharge in which the current reached its peak. This is interpreted (as before) as a result of

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increased electron temperature. Effective electron temperatures were calculated from the observed line intensities under the assumption (known to be incorrect) of a Maxwellian distribution of the electron velocities. The greatest electron temperature thus found was 40 eV. An O VII line that should be excited at an electron temperature of 100 eV was sought but not found. It is concluded that the maximum effective electron temperature reached during the discharge is between 40 and 100 eV. Orig.art.has: 2 figures.

ASSOCIATION: none

SUBMITTED: 28Apr63 DATE ACQ: 28Apr64 ENCL: 00

SUB CODE: PH NR REF SOV: 004 OTHER: 003

Card 2/2

L 42104-66 EWT(1) IJP(c) AT

ACC NR: AP6003165 SOURCE CODE: UR/0030/65/000/012/0073/0074

AUTHOR: Pashinin, P. P. (Candidate of physico-mathematical sciences); Mazing, M.A. (Candidate of physico-mathematical sciences)

ORG: none

TITLE: Conference on atomic spectra and radiation processes

SOURCE: AN SSSR. Vestnik, no. 12, 1965, 73-74

TOPIC TAGS: absorption spectrum, laser application, elastic scattering, spectroscopy, electron, nuclear physics conference

ABSTRACT: Several Soviet physicists attended the Conference on Atomic Spectra and Radiation Processes held in Oxford, England on 12-14 April, 1965. P. P. Pashinin (Lebedev Institute) presented a paper on laser-induced air breakdown. M. A. Mazing (Lebedev Institute) reported on a spectroscopic method of investigating the elastic scattering of slow electrons by nuclei. N. P. Penkin (Leningrad State University) announced the results of his latest studies of absorption spectra of group II and III atoms by means of D. S. Pozhdestvenskiy's method of "hooks."

SUB CODE: 20/ SUBM DATE: none/

Card 1/1 af

L 23746-66 EWT(l)/EWT(m) IJP(c) JD/JG/AT
ACC NR: AP6007214 SOURCE CODE: UR/0056/66/050/002/0343/0348

AUTHORS: Mazing, M. A.; Vrublevskaya, N. A.

ORG: Institute of Physics im. P N Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Spectroscopic investigation of the elastic scattering of slow electrons by cesium and argon atoms

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 2, 1966, 343-348

TOPIC TAGS: elastic scattering, electron scattering, cesium, argon, absorption spectrum, line shift, absorption edge, quantum number

ABSTRACT: Measurements were made of the shift, due to the presence of cesium and argon atoms, of the absorption lines of cesium near the edge of the principal series at the wavelength 3183 Å. Hydrogen and krypton lamps were used as sources of the continuous spectrum. The absorption spectra were measured with a spectrograph (VFS-3) having a dispersion of 2 Å/mm. An iron-arc spectrum was superimposed on the

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ACC NR: AP6007214

spectrum under investigation to establish the absorption-line positions. The spectra were recorded at cesium-atom densities (0.1 - 2.5) x 10^{17} cm^{-3}. The measurements were made with lines having principal quantum numbers n = 18 -- 47, and in some cases up to n = 54. The shift of the lines along the series was not constant even for large n > 40. The results were compared with the theoretically calculated amplitudes of elastic scattering of electrons by cesium and argon atoms in the electron energy range ~ 0.005 -- 0.05 ev. Extrapolation of the measured shift to the edge of the series gave the values of the cross section for the elastic scattering of the electrons at zero energy, (1.5 ± 0.4) x 10^{-13} cm^2. The limits of applicability of this result are discussed. The authors thank V. A. Alekseyev, L. A. Vaynshteyn, S. L. Mandel'shtam, and I. I. Sobel'man for interest in the work and a discussion of the results. Orig. art. has: 2 figures and 7 formulas.

SUB CODE: 20/ SUBM DATE: 05Aug65/ ORIG REF: 005/ OTH REF: 008

Card 2/2

ACC NR: AP7002421 SOURCE CODE: UR/0051/66/021/006/0749/0750

AUTHOR: Mazing, M. A.; Penkin, N. P.

ORG: none

TITLE: On the absolute value of the oscillator strength of a resonant transition in a sodium atom

SOURCE: Optika i spektroskopiya, v. 21, no. 6, 1966, 749-750

TOPIC TAGS: sodium, optic transition, oscillator strength, resonance line, line broadening

ABSTRACT: This is a continuation of earlier work (Opt i spektr. v. 11, 3, 1961), where the value obtained for the oscillator strength (1.15) was calculated without allowance for certain phenomena. In the present communication the authors recalculate this quantity with allowance for the resonance broadening and for the insufficient optical thickness of the layer used in the earlier experiment. The results give a lower value for the oscillator strength (1.03), and indicate that it cannot exceed 1.05 at any rate. This brings it closer to the value obtained elsewhere for potassium (1.04). Orig. art. has: 1 figure and 2 formulas.

SUB CODE: 20/ SUBM DATE: 06Jul64/ ORIG REF: 004/ OTH REF: 006

Card 1/1 UDC: 539.184:546.33

AUTHOR: Mazing, R. I. (Moscow) SOV/179-59-3-23/45

TITLE: Elasto-plastic Deformation of a Rapidly Rotating Cylinder (Uprugo-plasticheskaya deformatsiya bystro vrashchayushchegosya tsilindra)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1959, Nr 3, pp 143-147 (USSR)

ABSTRACT: The problem of the elasto-plastic deformation of an infinitely long rapidly rotating cylinder is considered, allowing for the compressibility of the material, which is taken as ideally plastic. It is assumed that the cylinder is in a state of plane strain. The method of Hill, Lee and Tupper (Ref 1) used by them in the problem of a tube under internal pressure is adapted to the present problem. The flow condition

$$\sigma_1 - \sigma_2 = 1,$$

where σ_1 and σ_2 are respectively the tangential and radial stresses corresponding to the flow limit in simple tension, is combined with the equilibrium equations and the boundary conditions to give an expression (Eq 3) for

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tangential and radial stresses in the plastic region. An equation (Eq 5) is also obtained connecting the rotational velocity and the radius of the elasto-plastic boundary. Expressions are derived for the stresses in the plastic region, and the results of the calculations by Hill's method are compared (Figs 3-5) with those obtained from the piecewise-linear theory of plasticity (Ref 2). There are 6 figures and 3 references, 1 of which is Soviet and 2 English.

SUBMITTED: August 4, 1958

88527

S/179/60/000/006/024/036
E081/E135

11.2313

AUTHOR: Mazing, R.I., (Moscow)

TITLE: Influence of the Form of Impulses on the Deflection of a Circular Plate

PERIODICAL: Izvestiya Akademii nauk SSSR,Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1960, No. 6, pp. 143-146

TEXT: It is known that the form of the loading impulse does not affect the final deflection of a rigid-plastic beam (Ref.1), whereas it does significantly affect the final deformation of a rigid-plastic cylindrical shell. It is therefore of interest to discuss the influence of the form of the impulse on the deflection of plates. In the present note, the problem is generalised for an arbitrary form of impulse. By comparing the final deflections arising from the action of equal square and sinusoidal impulses it is found that the final deflection of a plate is independent of the form of the impulse. The circular freely supported plate of rigid ideally plastic material is loaded with a load $P_T(\tau)$ such that $P_T(0) \geqslant P_0$, where P_0

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Influence of the Form of Impulses on the Deflection of a Circular Plate

is the limiting static load. Possible load forms are shown in Fig.1, where curves 1 and 2 are high "shock" loads, curve 3 is a high "explosive" load, and curve 4 is a medium load. For a solution of the problem, the Tresca plasticity conditions (Fig.2) and the associated law of flow are used. The equation of dynamic equilibrium is:

$$\frac{\partial(\xi m)}{\partial \xi} - n = -6\alpha \int_0^{\xi} \left[T - \frac{1}{\alpha\delta} \eta_{\tau\tau} \right] \xi \, d\xi \qquad (1)$$

where α, δ, m, n, η, ξ are defined by:

$\alpha = PR^2/6M_0$; $\delta = 6M_0\tau_0^3/\mu R^3$; $m = M/M_0$; $n = N/M_0$; $\eta = w/R$;

$\xi = r/R$;

P is the maximum value of the load; τ_0 is a characteristic time; μ is the mass of the plate per unit area of the middle

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surface; M, N, M_0 are respectively the radial, circumferential and limiting static moments. The following cases of "high" shock loading are considered:

1) $1 \leqslant \alpha T(0) \leqslant 2$, $dT(0)/d\tau > 0$, $\alpha T_{max} > 2$

2) $2 \leqslant \alpha T(0)$, $dT(0)/d\tau > 0$.

The motion of the plate is divided into 5 phases; these are analysed separately and lead respectively to 5 equations. The total displacement of the plate is obtained by addition of these five equations. Fig.3 shows the form of the plate deflection in the various phases of motion for simusoidal impulses and for α = 2, 4, 8. Fig.4 shows the dependence of the central deflection of the plate on α ($\alpha = PR^2/6M_0$; R is presumably the plate radius although this is not explicitly stated) for equal sinusoidal (curve 1) and square (curve 2) impulses. There is an

88527
S/179/60/000/006/024/036
E081/E135

Influence of the Form of Impulses on the Deflection of a Circular Plate

insignificant effect of the form of impulse on deflection within the limits of load considered in the paper. The same conclusion has been reached for loading of the "explosive" type (Ref.4).
There are 4 figures and 5 references: 2 English and 3 Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet, Kafedra teorii plastichnosti
(Moscow State University, Department of Plasticity Theory)

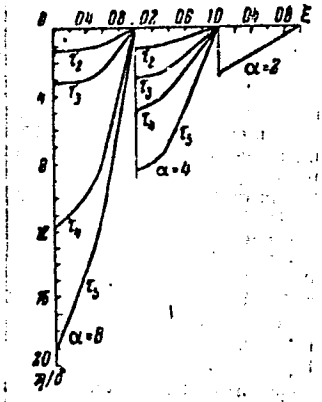
SUBMITTED: July 30, 1959

Card 4/5

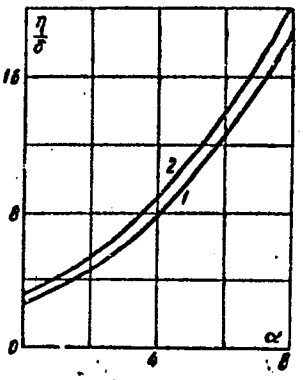
88527

S/179/60/000/006/024/036
E081/E135

Influence of the Form of Impulses on the Deflection of a Circular Plate



Фиг. 3



Фиг. 4

Fig.4

Card 5/5

BRONSKIY, A.P.; KLYUSHNIKOV, V.D.; MAZING, R.I.; RABOTNOV, Yu.N.; SHESTERIKOV, S.A.

Dynamic strength of building materials at medium deformation rates. PMTF no.1:118-130 Ja-F '62. (MIRA 15:4)
(Deformations (Mechanics)) (Strength of materials)

14-57-7-15066

Translation from: Referativnyy zhurnal, Geografiya, 1957, Nf 7, p 143 (USSR)

AUTHOR: Mazing, V. V.

TITLE: Determining the Extent of Swampy Forests Drying From a Study of Their Vegetation (Opyt opredeleniya stepeni osusheniya bolotnykh lesov po kharakteru rastitel'nosti)

PERIODICAL: Tr. In-ta lesa AN SSSR, 1955, Vol 31, pp 142-148

ABSTRACT: These studies were conducted in small, shallow swamps of the surface type at the "Yarvsel'ye" Experimental Forest Farm of the Estonian Agricultural Academy, located in the Ryapinaskiy Rayon of southeastern Estonia. Investigations of the forest zone were carried out on experimental areas which formed narrow rectangles measuring 1/5 by 1/4 hectare. These experimental areas ran parallel to the drainage ditches.

Card 1/4

Determining the Extent of Swampy Forests (Cont.)

For the purpose of studying mosses, grasses, and shrubs, plots of 4 sq m were selected on each experimental area. Development, height, and general productivity of all the plants found on these plots were noted. A total of 548 plots was studied, 380 of which were located on one section, and the remainder served as comparative control plots on other sections of the same type. Two methods were employed to study cover plant associations: 1) all the studies were first grouped ecologically according to L. G. Ramenskiy's method, and the moist experimental areas were studied first, while the areas of maximum dryness were studied last; 2) next, all the studies were arranged according to the degree of drying out attained by surface swamps and the extent to which one plant association (pines and sphagnum moss cover) had replaced another (pines and a cover of forest mosses). Both methods yielded similar results. These data support the contention that mosses serve as reliable indicators of forest water distribution. Swamp drying progresses in four stages: 1) sphagnum mosses occupy from 75 to 100 percent of an area; 2)

Determining the Extent of Swampy Forests (Cont.) 14-57-7-15066

sphagnum mosses predominate, while forest mosses occupy more than 25 percent of an area; 3) forest mosses predominate, but sphagnum mosses occupy 25 percent or more of an area; 4) forest mosses predominate, and sphagnum mosses occupy at most 25 percent of an area or are entirely absent. The number of areas in which a particular known species occurs, and the extent to which it covers these areas, constitute good quantitative indicators of dryness. Three kinds of studies were undertaken to determine the extent to which the thickness of peat layer influences plant association changes. Plant covers on peat layers 0.3 m to 0.5 m, 0.5 m to 1.0 m, and 1.0 m to 1.5 m thick were investigated. It was discovered that changes in the incidence of occurrence of species growing in thin peat layers were quite different from those in thicker layers. The method of carrying out these investigations can be simplified by being limited to the study of sphagnum and forest mosses. The ratio between these serves as an excellent criterion of the extent to which swamps have dried out. Moreover, a percentage determination of the species

Card 3/4

Determining the Extent of Swampy Forests (Cont.)

present in a given plant cover should be substituted for visual approximation of its development and distribution. The results arrived at in this study should be verified by more extensive data.

Card 4/4

G. A.

MAZING, V.V., Cand Biol Sci -- (diss) "Vegetative societies of the upper marshes of eastern Estonia and their dynamics." Tartu, 1958, 27 pp (Tartu State Univ) 150 copies (KL, 27-58, 107)

MAZING, V.V.

Selecting tree and shrub species for the attraction of birds breeding in open nests in cities. Ornitologiia no.3:425-429 '60.
(MIRA 14:6)

(Birds, Protection of)

MAZING, V.V. [Masing, V.]; TRASS, Kh.Kh. [Trass, H.]

Development of some theoretical problems in the works of Estonian geobotanists. Bot. zhur. 48 no.4:473-485 Ap '63. (MIRA 16:5)

1. Tartuskiy universitet.
(Estonia—Phytosociology)

MAZING, V. Ye.

"Screening of the intake valve"

report presented at the conference on Combustion and Formation of the Mixture in Diesel Engines, convened by the Motor Laboratory, Acad. Sci. USSR, Moscow 10-12 June 1958.
(Vest. Ak Nauk SSSR, 1958, No. 9, 115-117)

S/262/62/000/004/016/024
I014/I252

AUTHOR: Mazing, V.Ye.

TITLE. Screening of intake valves of a high-speed Diesel engine

PERIODICAL: Referativnyy zhurnal, Silovyye ustanovki, no. 4, 1963, 58, abstract 42.4.342 In collection "Sgoraniye i smeseobtazovaniye v dizelyakh", M., AN SSSR, 1960, 68–74

TEXT: The theoretical and experimental investigation of air turbulence due to screening is dealt with. In order to obtain maximum eddies the screen must be set at an angle $\alpha = 90°$ or $\alpha = 270°$ to the cylinder radius, depending on the direction of the eddy produced. For one valve the screen span angle must be $\gamma = 180°$, for two valves $\gamma_1 = \gamma_2 = 180°$, and when only one valve is screened ($\gamma = 0$) —, $\gamma_1 = 180°$. The angular velocity of the axial eddy is proportional to the velocity of air flow through the intake valve and inversely proportional to the cylinder diameter. Recesses for the valves in the piston botton are inadvisable, in view of the resulting weakening of the axial eddy. There are 5 figures.

[Abstracter's note: Complete translation.]

Card 1/1

L 40279-65

ACCESSION NR: AR4046124 S/0273/64/000/008/0034/0034

SOURCE: Ref. zh. Dvigateli vnutrennego sgoraniya. Otdel'nyy vypusk, 8.39.184

AUTHOR: Mazing, V. Ye.; Khachiyan, A. S.

TITLE: Analysis of the combined effects of intake valve shielding and the number and dimensions of perforations in an injection atomizer on the operation of a high speed diesel engine

speed diesel engine

CITED SOURCE: Tr. Tsentr. n.-i. avtomob. i avtomotorn. in-ta, vy p. 62, 1964, 46-71

TOPIC TAGS: high speed diesel, fuel injection, intake valve shielding, atomizer perforation, atomizer design, axial vortex, diesel engine

TRANSLATION: The axial vortex, i.e. the vortex with an axis coincident to the axis of a cylinder, exerts a major effect on atomization of fuel in a diesel engine with a Hesselman-type open combustion chamber and a multi-perforation injector located along the cylinder's axis. To obtain an adequately efficient operation, the in-

tensity (i.e. the mean angular velocity) of this axial vortex must [illegible]

Card 1/5

L 40279-65

ACCESSION NR: AR4046124

nite relationship to the basic parameters of the fuel feed system - the number of perforations in the injector, the reach of the spray jet, the fineness and level [illegible] of the atomized spray, as well as the feed program. An axial vor-

L 40279-65
ACCESSION NR: AR4046124

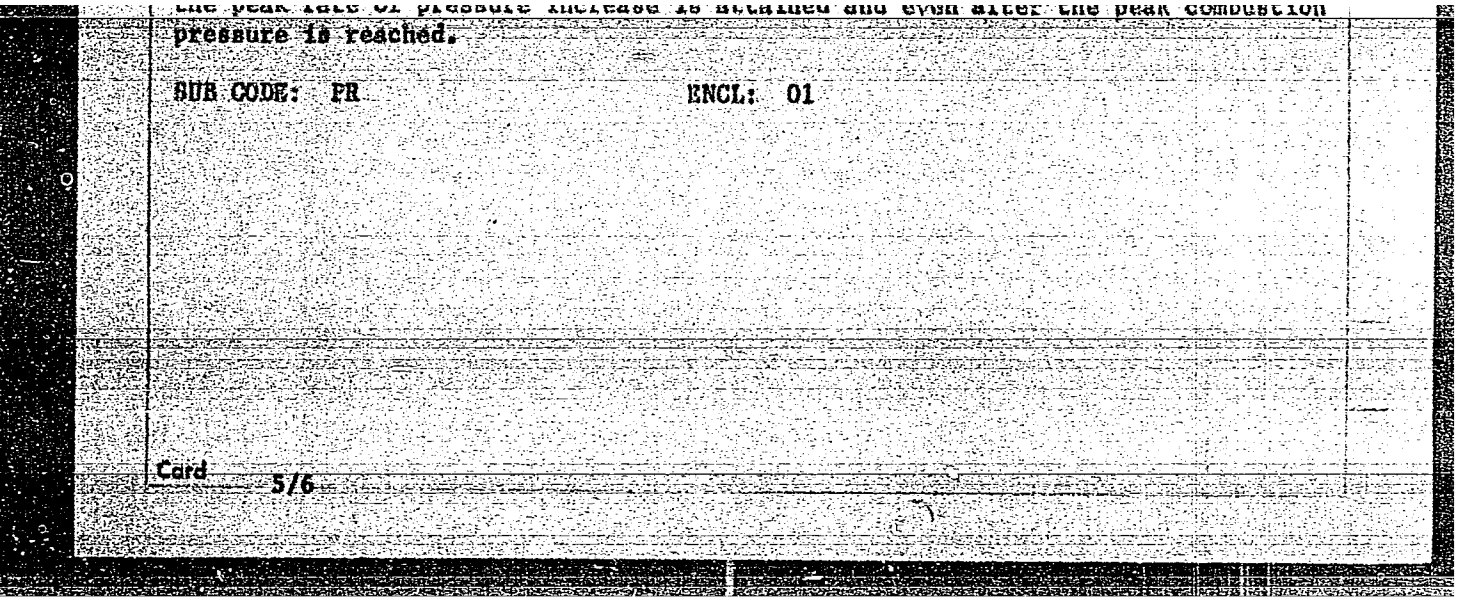
Injection pressure parameters and feed programs were identical for all variants of atomizers when operating conditions in a given fuel system (i.e. rpm, rack position, etc) also remained identical. Atomization parameters (i.e. fineness of

Card 3/6

L 40279-65
ACCESSION NR: AR4046124

methods of generating a vortex and the volume of required experimental work is thus reduced substantially. Valve shielding along a quarter of the perimeter results in an insignificant decrease in the fill factor, especially at low rpm (up

vortex on engine operation is positive, an increase in the mean angular velocity of the vortex produces an improved intensity of combustion, as well as peak pres-



MAZING, Yu. K.:

MAZING, Yu. K.: "Investigation of the process of fatigue breakdown of carbon structural steel by the method of continuous defectoscopy". Tallin, 1955. Min Higher Education USSR. Tallin Polytechnic Inst, Chair of the Principles of Machine Building. (Dissertations for the Degree of Candidate of Technical Sciences)

SO: Knizhnaya letopis' No 44, 29 October 1955. Moscow.

PAVLOVA, G.N.; MAZIR, V.P.; MORDUKHAY-BOLTOVSKIY, D.D.; MOISEYEV, I.N., red.; IVANOVA, Z.V., tekhn. red.; SERGEYEV, A.N., tekhn. red.

[Hydrogeological yearbook]Gidrologicheskii ezhegodnik. Leningrad, Gidrometeor. izd-vo. 1958. Vol.4.[Caspian basin (except the Caucasus and Central Asia)Bassein Kaspiiskogo moria (bez Kavkaza i Srednei Azii). Nos.4,8. [Kuybyshev Reservoir (Volga River basin below Cheboksary and the Kama River basin from the Vyatka River to the Bolga Hydroelectric Power Station) and the Volga River basin below the Volga Hydroelectric Power Station]Kuibyshevskoe vodokhranilishche (bassein r.Volgi nizhe g.Cheboksary i bassein r.Kamy nizhe r.Viatki - do Volzhskoi GES) i bassein r. Volgi nizhe Volzhskoi GES. Pod red. G.N.Pavlovoi. 1961. 230 p. (MIRA 15:11)

(Kuybyshev Reservoir--Hydrology)
(Volga Valley--Hydrology)

MAZIRA, P.V. [Mazyra, P.V.], inzh.-mekhanik

KL-25 tow braking and scutching machine. Mekh.sil'.hosp. 10 no.1: 27-28 Ja '59. (MIRA 12:4)
(Flax)
(Agricultural machinery)

MAZIRA, P.V. [Mazyra, P.V.], inzh.-mekhanik

ZSTN-2,8 fertilizer spreader. Mekh. sil'. hosp. 10 no.3:3 of cover Mr. '59. (MIRA 12:6)

(Fertilizer spreader)

MAZIRA, P.V. [Mazyra, P.V.], inzh.-mekhanik

PRZh-1,7 manure spreader. Mekh.sil'.hosp. 10 no.5:11-12 My '59.
(MIRA 12:7)

(Fertilizer spreaders)

MAZIRA, P.V.[Mazyra, P.V.], inzh.-mekhanik

DVSSh-16 self-propelled chassis and machinery for it. Mekh. sil'.hosp. 10 no.12:27-28 D '59. (MIRA 13:3)
(Agricultural machinery)

MAZIRA, P.V. (Masyra, P.V.), inzh.-mekhanik

Attachment for ammonia water application. Mekh. sil'. hosp. 11 no.7:27-28 Jl '60. (MIRA 13:10)
(Fertilizer spreaders) (Ammonia)

MAZIRA, P.V. [Mazyra, P.V.]

Simple but convenient. Mekh. sil'. hosp. 14 no.11:24 N'63.
(MIRA 17:2)

1. Glavnyy inzh. Zgurevskogo otdeleniya "Sil'gosptekhniki" Yagotinskogo rayona Kiyevskoy oblasti.

MAZITOV, A. Sh.

22728 Mazitov, A. Sh. Morfolgicheskaya Kharakteristika Argirofil'No Go Veshestva V Sosudakh Opukholey. Soobsh. No. I Sbornik Nauch. Trudov Ashkir, Med. In-Ta Im. 15 Letiya Vlksm, T. IX, 1949, S. 77-79

So: Letopis', No. 30, 1949

MAZITOV, B S

[illegible]

PHASE I BOOK EXPLOITATION SOV/5410

Tashkentskaya konferentsiya po mirnomu ispol'zovaniyu atomnoy energii, Tashkent, 1959.

Trudy (Transactions of the Tashkent Conference on the Peaceful [illegible] of Atomic Energy) v. 2. Tashkent, Izd-vo AN UzSSR, 1960. [illegible] p. Errata slip inserted. 1,500 copies printed.

Sponsoring Agency: Akademiya nauk Uzbekskoy SSR.

Responsible Ed.: S. V. Starodubtsev, Academician, Academy of Sciences Uzbek SSR. Editorial Board: A. A. Abdullayev, Candidate of Physics and Mathematics; D. M. Abdurasulov, Doctor of Medical Sciences; U. A. Arifov, Academician, Academy of Sciences Uzbek SSR; A. A. Borodulina, Candidate of Biological Sciences; V. N. Ivashev; G. S. Ikramova; A. Ye. Kiv; Ye. M. Shabanov, Candidate of Physics and Mathematics; A. I. Nikolayev, Candidate of Medical Sciences; D. Nishanov, Candidate of Chemical Sciences; A. S. Sadykov, Corresponding Member, Academy of Sciences USSR, Academician, Academy of Sciences Uzbek SSR; Yu. N. Talanin,

Card 1/20

Transactions of the Tashkent (Cont.) SOV/5410

Candidate of Physics and Mathematics; Ya. Kh. Turakulov, Doctor of Biological Sciences. Ed.: R. I. Khamidov; Tech. Ed.: A. G. Babakhanova.

PURPOSE : The publication is intended for scientific workers and specialists employed in enterprises where radioactive isotopes and nuclear radiation are used for research in chemical, geological, and technological fields.

COVERAGE: This collection of 133 articles represents the second volume of the Transactions of the Tashkent Conference on the Peaceful Uses of Atomic Energy. The individual articles deal with a wide range of problems in the field of nuclear radiation, including: production and chemical analysis of radioactive isotopes; investigation of the kinetics of chemical reactions by means of isotopes; application of spectral analysis for the manufacturing of radioactive preparations; radioactive methods for determining the content of elements in the rocks; and an analysis of methods for obtaining pure substances. Certain

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Transactions of the Tashkent (Cont.) SOV/5410

instruments used, such as automatic regulators, flowmeters, level gauges, and high-sensitivity gamma-relays, are described. No personalities are mentioned. References follow individual articles.

TABLE OF CONTENTS:

RADIOACTIVE ISOTOPES AND NUCLEAR RADIATION IN ENGINEERING AND GEOLOGY

87618
S/166/60/000/005/007/008
C111/C222

21-7100

AUTHORS: Akbayev, R.A., Mazitov, B.S. and Imamov, T.Kh.

TITLE: The Enlargement of the Sensitivity for the Gamma-Defectoscopic Control

PERIODICAL: Izvestiya Akademii nauk Uzbekskoy SSR, Seriya fiziko-matematicheskikh nauk, 1960, No.5,pp.80-82

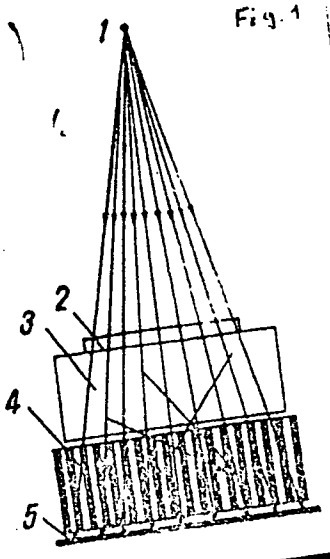
TEXT: For the investigation with the aid of the gamma radiation of samples of a material whether there are defects (foreign bodies, cavities etc.), the thickness δ of the sample is of great importance. With an increasing δ the sensitivity of the method decreases rapidly since in big samples the primary γ-radiation is scattered and, by this secondary radiation, the image becomes unclean. For this reason the authors propose to put an absorbing intermediate layer (fig.1) between the sample and the film, which consists of parallel (running in the direction of the primary γ-radiation) lead plates of the thickness 0.3 mm; between them there are papers of the same thickness. Thus it is reached that the primary radiation reaches the plate without any hindering while the scattered radiation is absorbed. The experiments (gamma-rays of Cs^{137} and Ir^{192}) carried out with the proposed arrangement show a clear sharpening of the image (fig.3).

Card 1/5

87618
S/166/60/000/005/007/008
C111/C222

The Enlargement of the Sensitivity for the Gamma-Defectoscopic Control

Fig.1



Card 2/5

87210

S/166/60/000/005/007/008
C111/C222

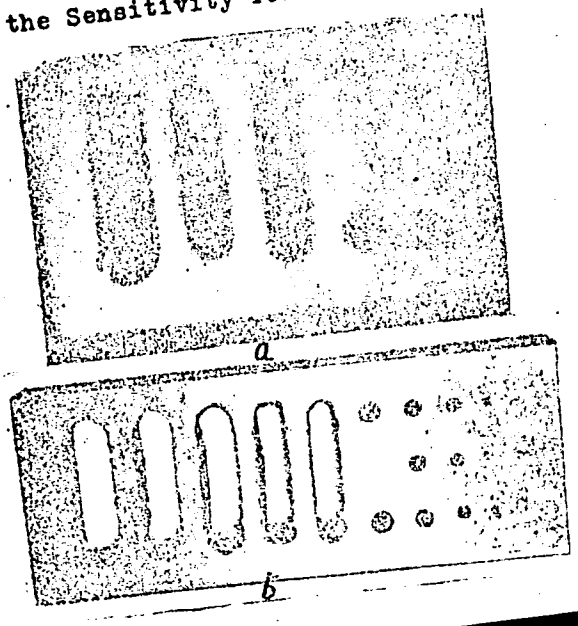
The Enlargement of the Sensitivity for the Gamma-Defectoscopic Control

Fig.1. Scheme of the experiment:
1- -source 2 - standard 3 - sample 4 - absorbing layer 5 - film.

87218
S/166/60/000/005/007/008
C111/C222

The Enlargement of the Sensitivity for the Gamma-Defectoscopic Control

Fig. 3



Card 4/5

87218

S/166/60/000/005/007/008
C111/C222

The Enlargement of the Sensitivity for the Gamma-Defectoscopic Control

Fig. 3: Defectoscopic photo (a) and photo (b) of the standard (in (a) one half is with and one half is without an absorbing intermediate layer).
There are 3 figures and 4 Soviet references.

ASSOCIATION: Institut yadernoy fiziki AN Uz SSR (Institute of Nuclear Physics of the Academy of Sciences Uzbekskaya SSR)

SUBMITTED: June 7, 1960

Card 5/5

S/124/62/000/005/035/04
D251/D308

10.1200

AUTHORS: Tekenov, Zh., and Mazitov, B.S.

TITLE: Measuring the velocity of a current in a boundary layer

PERIODICAL: Referativnyy zhurnal. Mekhanika, no. 5, 1962, 134, abstract 5B878 (V sb. Nekotoryye vopr. prikl. fiz., Tashkent, AN UzSSR, 1961, 46 - 48)

TEXT: It is proposed to measure the velocity of a current in a boundary layer by the deflection of a horizontally placed quartz filament, one end of which is rigidly joined to a vertical measuring microscope. The distance between the filament and the surface of the solid wall is measured by a horizontal stereoscopic microscope. The authors show that the proposed method can be applied to investigate the boundary layer which does not permit measurement by any other method. The scheme of the apparatus is given, and also some curves obtained with current velocities from 4 to 15 m/sec. The actual characteristics of the quartz filament, in particular its diameter, are not given which makes it difficult to compare t

Card 1/2

S/124/62/000/005/035/048
D251/D308

Measuring the velocity of a ...

given method with other measurements. [Abstractor's note: Complete translation].

Card 2/2

L 9969-65 EWT(m)/EPF(c)/EPF(n)-2/EWP(j) Pc-4/Pr-4/Pu-4 AFMDC GG/MLK/IM

ACCESSION NR:AT4046910 S/0000/64/000/000/0044/0048

AUTHOR: Akbayev, R. A.; Mazitov, B. S.; Pashinskiy, S. Z.

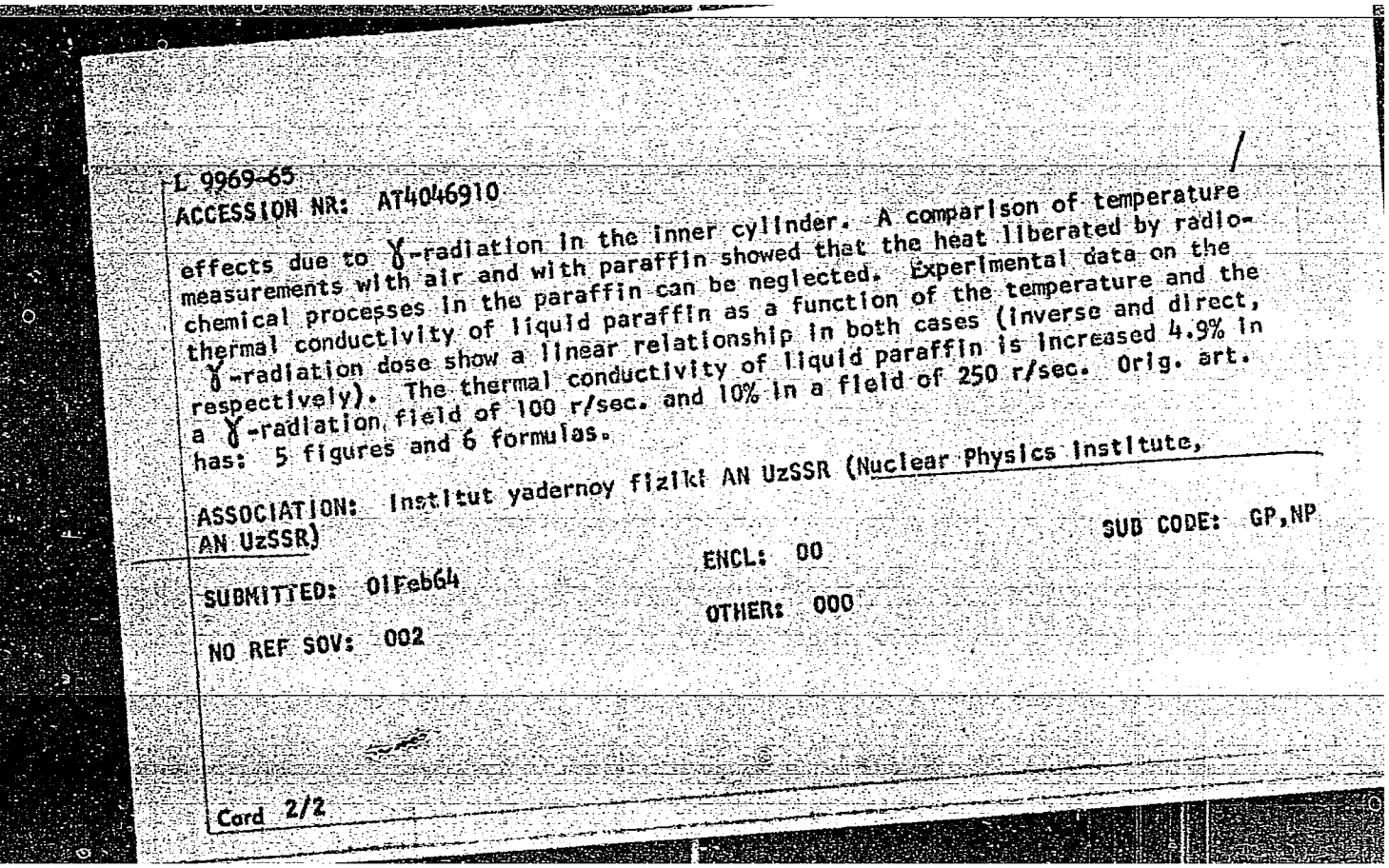
TITLE: Investigation of the thermal conductivity of liquid paraffin in a field of high-energy Gamma radiation

SOURCE: AN UzSSR, Institut yadernoy fiziki. Radiatsionny*ye effekty* v kondensirovanny*kh sredakr (Radiation effects in condensed media). Tashkent, Izd-vo Nauka UzSSR, 1964, 44-48

TOPIC TAGS: thermal conductivity, liquid paraffin, Gamma-radiation, paraffin conductivity

ABSTRACT: In the presence of γ-radiation, complex chemical molecules disintegrate into smaller fragments and electrons are liberated. These electrons can conditionally be considered as free, thus changing the thermophysical properties of materials, especially the thermal conductivity. The present authors studied the changes in thermal conductivity of liquid paraffin in a γ-radiation field as a function of the γ-radiation dose. The experimental set-up, consisting essentially of concentric cylinders and thermocouples, is described and equations are derived for the coefficient of thermal conductivity as corrected for the heating

Card 1/2



L 9969-65
ACCESSION NR: AT4046910

effects due to γ-radiation in the inner cylinder. A comparison of temperature measurements with air and with paraffin showed that the heat liberated by radiochemical processes in the paraffin can be neglected. Experimental data on the thermal conductivity of liquid paraffin as a function of the temperature and the γ-radiation dose show a linear relationship in both cases (inverse and direct, respectively). The thermal conductivity of liquid paraffin is increased 4.9% in a γ-radiation field of 100 r/sec. and 10% in a field of 250 r/sec. Orig. art. has: 5 figures and 6 formulas.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Nuclear Physics Institute, AN UzSSR)

SUBMITTED: 01Feb64 ENCL: 00 SUB CODE: GP,NP

NO REF SOV: 002 OTHER: 000

Card 2/2

L 12023-66 EWT(m)/EWA(h)

ACC NR: AT5028947 SOURCE CODE: UR/0000/63/000/000/0218/0222

AUTHOR: Imamov, T. Kh.; Mazitov, B. S.

ORG: none

TITLE: Determination of the spectral sensitivity of gamma ray detectors by means of a single source

SOURCE: Vsesoyuznyy seminar po primeneniyu radioaktivnykh izotopov v izmeritel'noy tekhnike i priborostroyenii. Frunze, 1961. Radioizotopnyye metody avtomaticheskogo kontrolya (Radioisotope methods of automatic control); trudy rasshirennogo soveshchaniya, v. 1. Frunze, Izd-vo AN KirgSSR, 1963, 218-222

TOPIC TAGS: gamma particle detector, gamma radiation, radiation sensitivity

ABSTRACT: The efficiency of a gamma detector is given by the ratio

$$\eta = \frac{N}{N_0}, \qquad (1)$$

where N is the number of quanta which give rise to a current pulse, and N_0 is the total number of quanta incident on the detector. The spectral sensitivity of counters and ionization chambers can be found by a

Card 1/3

single standard gamma source. This method is based on changes in the wavelength of gamma rays during the Compton effect. If the conditions of measurement are chosen so that the following relation applies:

$$\frac{1}{R_2^2}\cdot\frac{d\sigma}{d\Omega}=const, \qquad (2)$$

where $d\sigma/d\Omega$ is the differential cross section of Compton scattering per unit solid angle and R_2 is the distance from the scatterer to the detector, the convenient dependence

$$\eta(E)=const\cdot n(E), \qquad (3)$$

is obtained, where E is the gamma ray energy and $n = \eta I_i$. For a monochromatic source $d\sigma/d\Omega$ depends only on the scattering angle and hence in order for (2) to apply, a corresponding change of R_2 is necessary. Physically, (2) means that the number of quanta which can be measured remains constant independent of the scattering angle. Curves obtained on the basis of (2) for gamma rays of Cs^{137}, Zn^{65}, and Na^{24} are plotted. The use of harder gamma radiation makes it possible to cover a wider energy range, since the change in the hardness of the scattered gamma radiation is expressed by

$$\frac{\varepsilon}{\varepsilon_0}=\frac{1}{1+\varepsilon_0(1-\cos\theta)}. \qquad (4)$$

L 12023-66

ACC NR: AT5028947

where ω is the energy of the quantum and ω_0 is ω at $\theta = 0$. Calculations based on these formulas were carried out for the efficiency of STS-5, STS-6, and STS-2 counters, and the results agreed with those obtained by other authors. Orig. art. has: 5 figures, 9 formulas.

SUB CODE: 18/ SUBM DATE: 21Mar63/ ORIG REF: 004/ OTH REF: 001

HW

Card 3/3

S/137/62/000/008/053/065
A006/A101

AUTHOR: Mazitov, F. A.

TITLE: The effect of the composition, thermal and mechanical treatment of alumo-magnesium alloys upon the quality of anodic-formed films on them. Information I

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 8, 1962, 128, abstract 81879 ("Tr. Kazansk. khim.-tekhnol. in-ta", 1961, no. 27, 190 - 192)

TEXT: The investigation was carried out on Al-Mg alloys containing 1 - 98% Mg. Cast, mechanically polished specimens were anodized by the sulfuric-acid, the chromic-acid and the carbonate method. A higher Mg content in the alloy has a negative effect upon the formation of the anodic film. Anodic films obtained by the sulfuric-acid method are thicker than films formed by the chromic-acid and the carbonate methods. An increase in the Mg content in the alloy > 1% reduces the thickness of the oxide film. In a sulfuric-acid electrolyte the anodic film has a maximum thickness, and least thickness in a chromic electrolyte. Addition of Mg increases the porosity of anodic films.
[Abstracter's note: Complete translation]

N. Lukashina

Card 1/1

GLAZKOV, A.A.; MAZITOV, I.F.; FAKHREYEV, I.A.

Investigating inflow to the pumping wells of the Arlan oil field. Neftepromm. delo no.1:13-16 '64. (MIRA 17:4)

1. Ufimskiy neftyanoy nauchno-issledovatel'skiy institut i TSekh nauchno-issledovatel'skikh i proizvodstvennykh rabot neftepromyslovogo upravleniya "Arlanneft'".

MAZITOV, I.M.

Primary cancer of the fallopian tube. Kaz. med. zhur. no.5:78-79 S-O'63 (MIRA 16:12)

1. Vtoraya kafedra akusherstva i ginekologii (zav. - prof. I.V.Danilov) Kazanskogo gosudarstvennogo instituta dlya usovershenstvovaniya vrachey imeni Lenina.

MAZITOV, I.M.

Combination of uterine and extrauterine pregnancy. Kaz. med. zhur. no.6:61 N-D '63. (MIRA 17:10)

1. 1-ye ginekologicheskoye otdeleniye (zav. - M.I. Slepov) Kazanskoy gorodskoy bol'nitsy No.2 (glavnyy vrach - M. Sh. Mukhametova, konsul'tant - prof. I.V. Danilov).

L 47150-65 EWT(1)/EWP(m) WW

ACC NR: AR6000709 SOURCE CODE: UR/0124/65/000/009/B055/B055

AUTHOR: Mazitov I. Z.

50
B

TITLE: Flow over a plate in the presence of vortices

SOURCE: Ref. zh. Mekhanika, Abs. 9B359

REF SOURCE: Sb. Itog. Nauchn. konferentsiya Kazansk. un-ta za 1963 g. Sekts. matem. kibernet. i teoriya veroyatn., mekhan. Kazan', 1964, 115-117

TOPIC TAGS: incompressible fluid, viscous flow, boundary layer, vortex, PLANE FLOW

ABSTRACT: The plane flow of an incompressible viscous fluid is considered over a plate with velocity V_0 at infinity and in the presence of two point-vortices with circulations $\pm\Gamma$. These are distributed symmetrically around the leading edge (at distances $\pm h$ from the plate much larger than the boundary layer thickness). The problem is reduced to solving boundary layer equations for given velocity distribution outside the boundary layer. The existence of the solution is indicated where the vortices and the plate are placed within a closed sheet. Also the problem is solved for the case where the vortices affect the velocity distribution in only the potential flow. The solution is constructed by the method of successive approximations. It is shown that the drag of the plate decreases as the parameter $k = \Gamma/\pi V_0 h$ is increased. A. T. Onufriyev [Translation of abstract]

SUB CODE: 20

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L 11206-67 EWP(m)/EWT(1)/EWP(w) EM/WW

ACC NR: AR6020071 (N) SOURCE CODE: UR/0124/66/000/001/B070/B070

AUTHOR: Mazitov, I. Z.

TITLE: Cavitation flow around two parallel plates

SOURCE: Ref zh. Mekhanika, Abs. 1B504

REF SOURCE: Tr. Seminara po obratn. krayev. zadacham. Kazansk un-t, vyp. 2, 1964, 131-141

TOPIC TAGS: cavitation, cavity flow, plane flow, flat plate

ABSTRACT: The author considers the problem of two-dimensional cavitation flow of a stream of ideal incompressible fluid at a zero angle of attack around two parallel plates according to the scheme proposed by A. M. Lavrent'yev. Several versions of flow schemes are studied, in particular where each plate is a section of the boundary corresponding to a cavitation hollow surrounded by a layer of liquid in rotational motion. The complex potentials of the flows are found as well as the shape of the free boundaries, and the possibility for various modifications of the scheme is discussed as a function of the caviation number, the length of the plates, the distance between them, etc. The limiting case of the given scheme corresponding to plates of zero length is the well-known problem on circulation flow around two symmetric cavities. Bibliography of 5 titles. V. P. Karlikov. [Translation of abstract]

SUB CODE: 20

Card 1/1 jb

MAZITOV, K.

Dedication to grain growers. Prof.-tekh. obr. 21 no.6:14 Je '64.
(MIRA 17:9)

USSR / Human and Animal Morphology. Circulatory System. S-3

Abs Jour: Ref Zhur-Biol., No 14, 1958, 64848.

Author : ~~Mazitov, K.~~ I.
Inst : Not given.
Title : Materials for the Study of the Morphology of the Endothelia of the Blood Bearing Capillaries in the Endocrine Organs.

Orig Pub: Azerb. Tibb. zh., 1957, No 4, 22-24 (Azerb.), 72-74.

Abstract: On the basis of the study of the nuclei of the endothelium of blood vessels, differences of the epithelium have been established in the epiphysis and the posterior lobe of the hypophysis, emanating from the elements of the midbrain and in the thyroid and the goiter glands and the anterior lobe of the hypophysis, emanating from the elements of the oral cavity of the embryo. -- Ye. V. Ryzhkov.

Card 1/1

GARIF'YANOV, N.S.; MAKITOV, R.K.; USACHEVA, N.F.

Rapid method for the quantitative determination of Gd^{3+} in rare earth salt solutions. Zhur. anal. khim. 18 no.2:281-[illegible] F '63. (MIRA 17:...

1. Kazan Branch of the Academy of Sciences of the U.S.S.R. and Kazan State University.

MAZITOV, R.K.

Temperature dependence of nuclear magnetic relaxation times of protons and deuterons in aqueous solutions of Mn^{2+} ions. Dokl. AN SSSR 152 no.2:375-378 S '63. (MIRA 16:11)

1. Kazanskiy gosudarstvennyy universitet im. V.I.Ul'yanova-Lenina. Predstavleno akademikom A.Ye. Arbuzovym.

MAYTOV, R.K.

Magnetic relaxation of Li^7 nuclei in aqueous solutions of paramagnetic salts. Zhur.strukt.khim. 5 no. 2:302-303 Mr-Ap '64. (MIRA 17:6)

1. Kazanskiy gosudarstvennyy universitet imeni V.I. Ul'yanova-Lenina.

MAZITOV, R. K.

Magnetic relazation of protons and deuterons in aqueous solutions of Cr^3 ions. Dokl. AN SSSR 156 no. 1:135-138 My '64. (MIRA 17:5)

1. Kazanskiy gosudarstvennyy universitet im. V. I. Ul'yanova-Lenina. Predstavleno akademikom A Ye. Arbuzovym.

MAZITOV, R.K.

Quadrupole nuclear relaxation of deuterium in liquids. Dokl. AN SSSR 156 no. 2:418-419 My '64. (MIRA 17:7)

1. Kazanskiy gosudarstvennyy universitet. Predstavleno akademikom A.Ye.Arbuzovym.

L 46172-65 EWT(1)/EPF(n)-2/EWG(m)/EPA(w)-2 Pz-6/Po-4/Pab-10/Pi-4 IJP(c)
ACCESSION NR: AP5009540 WW/AT S/0207/65/000/001/0027/0031

43
41
B

AUTHOR: Mazitov, R. K. (Novosibirsk)

TITLE: Damping of plasma waves 21

SOURCE: Prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 1, 1965, 27-31

TOPIC TAGS: plasma wave, wave damping, monochromatic wave, distribution function

ABSTRACT: The mechanism of formation of a plateau for the distribution function of the electron velocity during the course of damping of monochromatic plasma

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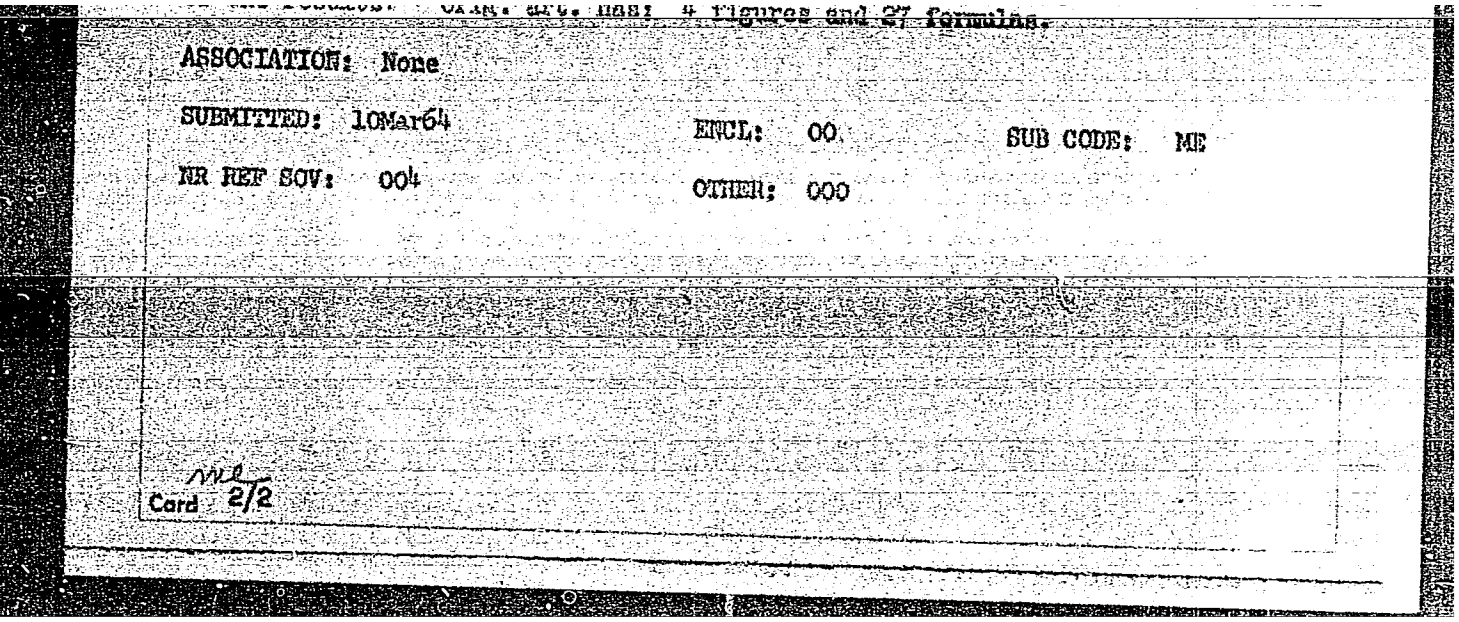
ACCESSION NR: AP5009540

tially on the electric field. A qualitative investigation of the formation of the plateau leads to an expression for a time dependence of the wave energy. "The author thanks R. Z. Sagdeev for guidance and V. I. Karpman for a ...



ASSOCIATION: None

SUBMITTED: 10Mar64 ENCL: 00 SUB CODE: ME

NR REF SOV: 004 OTHER: 000

Card 2/2

MAZITOV, R.K.; RIVKIND, A.I.

Nuclear relaxation in vanadyl salt solutions. Dokl. AN SSSR 166 no.3:654-657 Ja '66. (MIRA 19:1)

1. Kazanskiy gosudarstvennyy universitet im. V.I.Ul'yanova-Lenina i Kazanskiy fiziko-tekhnicheskiy institut AN SSSR. Submitted May 25, 1965.

L 23693-66 EWT(1)/EWT(m)/EEC(k)-2/T/EWP(t)/EWP(k) IJP(c) WG/JD/JG
ACC NR: AR6005201 SOURCE CODE: UR/0058/65/000/009/D043/D043

AUTHOR: Mazitov, R. K.

TITLE: Magnetic relaxation of Li^7 nuclei in aqueous solutions of paramagnetic salts

SOURCE: Ref. zh. Fizika, Abs. 9D344

REF. SOURCE: Sb. Itog. nauchn. konferentsiya Kazansk. un-ta za 1963 g. Sekts.: paramagnitn. rezonansa, spektroskopii i fiz. polimerov, radiofiz., astron., bion. Kazan', 1964, 15-16

TOPIC TAGS: lithium, relaxation process, aqueous solution, paramagnetic ion, dipole interaction, cation

TRANSLATION: The spin-echo method was used to measure the times of longitudinal and transverse relaxation T_1 and T_2 of Li^7 and H^1 nuclei in aqueous solutions containing paramagnetic ions and Li^+ ions. It is established that for most investigated solutions the ratio T_{1Li}/T_{2Li} lies in the interval 1.02 -- 1.017, thus pointing to a

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L 23693-66
ACC NR: AR6005201

magnetic dipole-dipole mechanism of relaxation of the Li^7 nuclei. Exceptions are certain solutions of the ions Mn^{2+} and Vo^{2+}, for which $T_{1Li}/T_{2Li} > 1.17$. A hypothesis is advanced that in this case a contribution is made to T_2 by the scalar interaction A.I.S between the paramagnetic ion and the Li^7 nucleus. A decrease in the concentration of Li^+ is accompanied by an increase in the relaxation times of the Li^7 nuclei. The effect is explained under the assumption that the average distance between the paramagnetic ion and the Li^7 decreases with increasing Li^+ concentration. Another possible mechanism is the formation of complexes of paramagnetic cations with Cl^- and NO_3^-.

SUB CODE: 20

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L 47128-66 EWT(l)/EWT(m)/EEC(k)-2/EWP(j)/T/EWP(t)/ETI/EWP(k)/EWP(l) IJP(c) WG/RTW/
ACC NR: AR6013642 JD/RM SOURCE CODE: UR/0058/65/000/010/D062/D062

AUTHOR: Mazitov, R. K.

REF SOURCE: Sb. Itog. nauchn. konferentsiya Kazansk. un-ta za 1963 g. Sekts.: paramagnitn. rezonansa, spektroskopii i fiz. polimerov, radiofiz., astron., bion. Kazan, 1964, 13-15

TITLE: Nuclear quadrupolar relaxation of deutrium in liquids

SOURCE: Ref. zh. Fizika, Abs. 10D448

TOPIC TAGS: spin lattice relaxation, dipole interaction

TRANSLATION: The spin lattice relaxation time T_1 of deutrium in 11 molecular liquids (ethanol, methanol, benzene, pyridine, etc.) was measured by the spin echo method at a frequency of 4.4 Mhz. It is found that T_1 is determined by the quadrupolar interactions and is independent of magnetic dipole-dipole interactions. The coefficients of quadrupolar bonding are also determined for the substances investigated by the use of published data on the reorientation times of the deutrons. In the authors' opinion, the closeness of relaxation times for deutrons in the methyl and methelene groups of ethanol is an indication that the reorientation times in these groups are identical. In deutrons which have a C-D bond in the different molecules, the quadrupolar bonding coefficients are not very different. The difference in quadrupolar bonding coeffi-

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ACC NR: AR6013642

cients for deutrium with an O-D bonding in water and alcohols is quite large. This can be, in part, explained as due to an improper choice of reorientation times for the hydroxyl groups in alcohols.

SUB CODE: 20/ ~~SUBM DATE: none~~

Cmrd 2/2 afs

MAZITOV, SH. S.

"Investigation of Stresses and Strains in the Bit of a Pneumatic Drill During a Longitudinal Stroke." Cand Tech Sci, Inst of Machine Science, Acad Sci USSR, Moscow, 1955. (KL, No 9, Feb 55)

SO: Sum. No. 631, 26 Aug 55-Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (14)

MAZITOV, Sh.S., kandidat tekhnicheskikh nauk.

Experimental verification of drop hammer rod calculations. Vest. mash. 35 no.12:44-47 '55. (MLRA 9:5)
(Forging machinery)

MAZITOV, Sh.S.

Forces and stresses at the point of a mechanical pick in the case of longitudinal impact and formulas suggested for calculating the strength of the point. Izv.Otd.est.nauk.AN Tadzh.SSR no.13:43-63 '56. (MLRA 9:10)

1.Otdel khlopkovodstva Akademii nauk Tadzhikskoy SSR.
(Strains and stresses) (Impact)

MAZITOV, Sh.S.

Experimental testing of the applicability of the wave theory for calculating machine parts for strength in connection with longitudinal impact. Izv.Otd.est.nauk AN Tadzh.SSR no.13:65-75 '56. (MIRA 9:10)

1.Otdel khlopkovodstva Akademii nauk Tadzhikskoy SSR.
(Impact) (Elasticity)

MAZITOV, Sh.S.

Some observations relative to the selection of the speed of impact by the striker on the drill steel of a hammer drill for purpose of increasing impact efficiency. Izv.Otd.est. nauk AN Tadzh.SSR no.14:63-67 '56. (MLRA 9:10)

1. Otdeleniye khlopkovodstva AN Tadzhikskoy SSR.
(Rock drills)

MAZITOV, Sh.S.

Experimental testing of some basic formulas for calculating rods of drop hammers in connection with longitudinal impact. Izv.Otd.est. nauk AN Tadzh.SSR no.14:69-76 '56. (MLRA 9:10)

1. Otdel khlopkovodstva AN Tadzhikskoy SSR.
(Forging machinery) (Strains and stresses)

SOV/124-58-3-3482

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 3, p 127 (USSR)

AUTHORS: Prigorovskiy, N. I., Mazitov, Sh. S.

TITLE: Techniques and Apparatus for Experimental Investigation of Stresses and Forces Appearing During Collision Impacts Between Machine Components (Metodika i apparatura dlya eksperimental'nogo issledovaniya napryazheniy i usiliy pri soudarenii detaley mashin)

PERIODICAL: Izv. Otd. yestestv. nauk AN TadzhSSR, 1956, Vol 15, pp 25-51

ABSTRACT: In the course of investigations impact phenomena were studied with the aid of wire strain gages and special two-ray cathode oscillographs capable of registering deformations ranging from 0.1 to 3% at frequencies of 35-25,000 cps. Experimental procedures are described, and the following four varieties of impact conditions, the solutions to which have been derived by other authors, are compared: 1) Transverse impact of a weight striking a beam or a ring made of photoelastically active material; 2) longitudinal collision of two steel rods, and 3) a transverse impact produced by a weight impinging on a steel H-beam.

V. N. Maksimov

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